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FORESTRY ON PRIVATE LANDS

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The forest area under public management does not exceed one-fourth of the total forest area of the country. It is not large enough or productive enough to satisfy, even under the most intensive management, more than a fraction of the national demand for wood. We must count, therefore, upon forestry on the lands now privately owned if the United States is to preserve its forest independence and grow the timber which will be needed in the future. The only choice is between a very large addition to the area under public management and management by the owners themselves. What, then, has been the result of private forestry thus far, and what is the prospect of its widespread practice?

What Has Been Done in Private Forestry

Complete information regarding the practice of forestry on private lands is impossible to secure. Since the Forest Service made its offer of coöperation with private forest owners in 1898, examinations of tracts aggregating not far from 10,000,000 acres have been made. This is, of course, but the merest fraction of all the forest in private hands; nor is even this all under forest management. The most important result of this coöperative work is that a large number of private owners have begun at least a partial practice of forestry. However fragmentary, this is of real value, chiefly for its widespread educational effect. In a number of cases working plans were adopted and are being carried out to the satisfaction of the owners. Doubtless many more large undertakings would have been attempted had the facts justified an expectation of larger returns.

Although the conservative management of private forest lands on a considerable scale can scarcely be said to exist as yet, more careful methods are gradually coming into use, while there are half-a-dozen conspicuous examples of thorough and profitable management which indicate what forestry may be expected to accomplish under

favorable conditions. There is reason to believe that forestry of some sort is practiced on private lands far more extensively than is generally realized or definitely known.

The heavy loss from fire has led to the largest progress thus far made in this direction. In Oregon, Washington and Idaho large tracts have been placed under organized protection by associations of timber land owners, each member of which pays pro rata toward the cost. The four fire protective associations of northern Idaho expended for fire protection in 1908 \$52,284.11 for protecting directly 1,257,787 acres of forest owned by members, and incidentally large areas of adjoining forest. The average cost, including fire fighting, was a little over four cents per acre. The reports of the associations show that the main emphasis was laid upon patrol. Thus one association apportioned its expenditures as follows:

Fire fighting	10.57 per cent.
New trails	16.98 per cent.
Cleaning old trails	12.98 per cent.
Patrol	49.23 per cent.
All other items	10.24 per cent.

In proportion to the completeness of patrol the fire loss is reduced. The forest in any part of the United States can be kept practically free of fire at a cost of from two to four cents per acre spent upon patrol. Next to patrol the chief expense was trail building, which in the above case took 29.96 per cent. of the total protection cost. Provision is made for tool boxes at convenient places, for tools and for horses, as well as for lookout stations.

Equally successful results have not yet been achieved over large areas of private forest lands by either individual or associated efforts in other parts of the country. But numerous small tracts in the East and South are now fairly well protected at moderate cost, and the owners report satisfactory recuperation and reproduction on the protected areas. A case worth mention is that of an owner in the South-central region, a coöoperator with the Forest Service, who is applying a working plan in the management of large holdings. Difficulty was found in keeping fires out of the cut-over land, owing to the carelessness of neighboring settlers. Therefore a tract of 1000 acres was set aside and given special protection. Fires have been kept out of this tract for five years, and the owner finds that full reproduction is now the reward of his efforts. Where the busi-

ness wisdom of protecting a large tract is in doubt such a test may well be tried. It is not costly, and the results speak for themselves. In most cases an object lesson of this sort, driving home the truth about fire protection, will convince the forest owner that he cannot afford fires.

At Corbin Park, in central New Hampshire, some 17,000 acres of forest have been carefully lumbered for five years in accordance with a working plan made by the Forest Service. The park is intended mainly for a game preserve, and all forest work is arranged with respect to its effect upon the game. Nevertheless, the revenue derived from the sale of live game and of forest products more than covers the expense of management and yields a satisfactory profit on the investment, while the future forest crop is steadily coming on. One of the larger private estates on the Hudson offers another example. The property, which embraces 1000 acres, has about 300 acres under forest, from which cordwood from improvement cuttings sells well in the local market. Good roads and the easy accessibility of the tract make it possible to handle the forest in this way as profitably as if large clear fellings were made, so that the maximum financial yield is secured with the minimum of disturbance to forest conditions. Where the stand is sparse planting is done, and the stock is raised in a forest nursery upon the estate. The methods employed and the results secured are of great educational value to the whole community.

A general working plan for a tract of 14,000 acres on North Manitou Island, in Lake Michigan, is being carried out with results which are thus far highly satisfactory to the owners. This plan includes a conspicuously successful system of fire protection, the control of grazing, nursery and forest planting work, improvement cuttings, the present restriction of cutting to overmature timber, the close utilization of lops and tops for cordwood, and the gradual introduction of conifers into the stand.

That good management pays is strikingly shown by the experience of the University of the South, at Sewanee, Tenn. In 1900 the University undertook to manage its 7000 acres of forest in accordance with recommendations made by the Forest Service. Immediate financial returns were desired, while expenditures for improvement were not permitted. In 1899 the University had considered an offer of \$3000 for the merchantable timber, and regarded it favorably.

At the time the working plan was made fires were injuring the forest by burning away the humus and damaging the timber. The plan recommended took into consideration the probable rise in local stumpage values, and embraced a series of fellings instead of an immediate sale of the whole merchantable stand. Since the plan went into effect the sum of \$18,101.76, above all expenses, has been received from the sale of timber. Meantime, fire has been controlled, excellent reproduction follows and the perpetuation of the forest is assured.

Among those private owners of forest who themselves make use of the timber produced, a number practice forestry in order to insure a permanent supply. Conspicuous among these are wood pulp and paper manufacturers, who largely own the forests from which they get their logs. In many cases they are limiting the cut to what the forest grows each year, thus insuring a permanent sustained yield. They also safeguard the forest by efficient fire protection. Where their present holdings are too small to meet the annual demand, these owners are buying new tracts of forest.

In point of variety and scope the work done on the Biltmore estate, in North Carolina, is remarkable. The forests, which cover 130,000 acres, are made self-sustaining by the production of various forms of material. Four million feet of lumber, five thousand cords of tannic acid wood and fuel, a thousand cords of tanbark, and several hundred cords of pulpwood are cut every year. At the same time the forest itself is steadily increasing in value. Workmen employed along the boundaries of the forest do duty as fire guards. Thus, fire protection is secured at least throughout all the accessible parts of the tract. In connection with all lumbering operations permanent logging roads are built. These minimize the present cost of transportation and will greatly reduce the cost of marketing future crops. The extension of the roads is steadily adding to the investment value of the forest. Moreover, they serve also as a network of fire lines. Forest planting is practiced where fire will not threaten its success. The experimental work in silviculture which is done at Biltmore is certain to make important additions to the science and practice of American forestry.

Since extensive forest planting is to be expected only when the conditions surrounding forestry are far more stable and advantageous than they are at present in most parts of this country, it is

not surprising that it has as yet been little attempted by private owners. What forest planting has been done on private lands is mainly the result of artificial encouragement, as by the Federal timber-culture laws, now repealed, or by bounties or tax exemptions offered by the States. The bounty and exemption laws are, as a rule, unsatisfactory in their results, and the forest area of the country has not been much extended by them. The total area of planted forest does not exceed 965,000 acres. Yet the total area of land which would yield its greatest returns from planted forest is more than 50,000,000 acres. In New England forest planting has been particularly successful, and is now being done on an increasing scale. Not including old plantings that have been cut, approximately 25,000 acres have been planted. From the trees that were planted in 1908 about 60,000,000 feet will be available when the plantings grow to merchantable size.

Realizing the advantage of an assured future timber supply, several railroads are adding to their forest holdings and managing their forest properties for the production of a sustained yield of cross-ties for their own roads. The success and economy of preservative treatment now make it possible to use for cross-ties the cheaper and more abundant woods. The practice of forestry by the railroads is, therefore, especially significant, because it includes, in addition to conservative management, the commercial use of timbers of lower grade. In a number of cases planting is done, also with a view to tie production, though such planting is usually a subordinate part of the forest policy.

As widely scattered illustrations of what forestry may do and is already doing these concrete examples are noteworthy. But as progress toward the general practice of forestry by private owners their total amount is altogether insignificant. To judge whether any general movement toward forest management on private holdings may be expected, we must consider what the future situation is likely to be.

What Discourages Private Forestry

Before the future of private forestry can be predicted the obstacles which impede it must be considered.

1. Low stumpage prices hold down forest values and create indifference to them. Forestry means an investment in growing

timber. If the investment is to show a profit the product must not sell below the cost of production. When the logs from the tract of an owner who is practicing forestry go to market their price is fixed by that of the general supply. Cheap stumpage discourages expenditure for protection and management. Ultimately a tree must sell for what it costs to grow it plus the grower's profit. Stumpage prices at this rate would not, it is true, guarantee the practice of forestry, but they would justify the outlay without which forestry is not practicable, and would recommend this expenditure to the owner as good business.

It is worth remarking that a lumber tariff supports stumpage prices. Putting lumber on the free list would enlarge the cheap stumpage area, and so tend to prevent stumpage from selling for enough to cover the cost of producing it. Further, it would not reduce the cost of lumber to the consumer, to whom "cheap lumber" rings persuasively. In my judgment, the entire advantage of a repeal of the lumber tariff would be appropriated by manufacturer and retailer, and the public would profit not at all.

In the end the public, that is to say the consumer, must pay the penalty for the rapid and wasteful harvesting of the present timber supply before a new one can be grown. From the national viewpoint, there is such a thing as having lumber too cheap for our own good. It is as though one were able to buy coal for half the winter below the wholesale price from a coal dealer about to leave town, but for the rest of the winter not able to buy any coal at all. I do not believe that the repeal of the lumber tariff would have any very important results in any direction; but in so far as free lumber would postpone the practice of private forestry, which it would tend to do, it would mean the continued devastation of forests on private lands, and in the end a market rise of timber toward famine prices, while it would lessen the immediate prospect of perpetuating home supplies.

2. The profits of forestry are lower than those offered by most investments in the United States. In older countries the difference, when it exists at all, is far less marked, because of the smaller opportunities for speculative profit. The rather unstable business conditions which prevail in new and relatively undeveloped countries like ours accentuate the preference of capital for enterprises with larger margins of profit.

3. A desire for quick returns rather than long-time investments is another bar to the practice of forestry in the United States. It is especially effective when no returns at all can be expected for some years. This latter obstacle is not always encountered; but when a beginning must be made by forest planting, returns must, of course, wait until the planted forest has acquired market value. Where mature forest forms the initial investment an immediate and usually a sustained yield can be secured.

4. The great danger of destructive forest fires often forces private forest owners to rush their timber to market. In many cases the cost of protection, or an exaggerated estimate of it, appears prohibitive to the owners. It must never be forgotten that without fairly effective protection from fire there is little hope of applying forestry as a permanent system of management. What can actually be done in the way of fire protection, and at what cost, has already been cited in the case of the fire protective associations of the Northwest. Wherever, as notably in the Northwest, coöperation with the state is secured in fire patrol on private tracts, a powerful stimulus is given the practice of private forestry.

5. In the minds of most large stumpage holders the most serious obstacle to conservative lumbering lies in a faulty system of forest taxation. It commonly happens that the working of tax laws discourages the holding either of standing timber or of cut-over lands. The fear of excessive or ill-devised taxation often furnishes the most powerful motive for reckless and premature cutting, and the actual tax burden has caused much cut-over land to revert to the state. It is true that tax assessors have sometimes been lenient in dealing with timberlands, so that in practice the effect of existing laws has not always been without mitigation. Nevertheless, there is no security to the owner of such lands that this state of things will continue. This is a powerful deterrent to the practice of forestry, which requires a long-term investment. In many cases high assessment, especially on non-resident owners, has actually forced the cutting of timber either prematurely or without provision for a second crop. In short, present methods of forest taxation too frequently raise the cost of timber production so high that private forestry becomes artificially and unnaturally precarious, and almost everywhere they menace the owner with a burden greater than the business of growing timber should in fairness be asked to support.

What May Encourage Private Forestry

The days of cheap stumpage in the United States will soon be over. Neither opening the doors to foreign timber, the use of substitutes for wood nor any other device can much delay the advance in forest values here. Foreign supplies are, or soon will be, insufficient to meet the growing home demands. A study of the world's timber supply shows that there will be no continuance of a surplus in the countries which are now exporters of timber. In time most countries, and we very soon, will have to face the alternative of home-grown wood or no wood at all. Therefore, as the forests of the United States, already over-cut, dwindle before axe and saw, there is bound to come so strong a rise in the price of all stumpage as to amount in the end to a timber famine. Just as over-cheap stumpage means wasteful and destructive logging, so stumpage at the cost of production, more than any other single factor, will assist to bring about more conservative management of productive private forest properties. When immature timber is understood to represent a substantial investment it is certain to be considered better worth looking after than is now the case. Protection and management for sustained yield will be given to valuable private forests, just as a permanent supply of raw material receives due attention in the establishment of a costly industrial plant. General business conditions also will tend to become more stable and uniform, and investments which yield a low interest rate and are permanent in character will grow in attractiveness.

The necessities of consumers of wood or of other forest products will promote the practice of forestry by certain classes of interests. Thus, white pine has already been extensively planted by New England box manufacturers; mining companies using large quantities of mine timbers, and pulp and paper manufacturers, already find it worth while to provide for permanent supplies; and railroads, at considerable expense, are planting forests, and planning management of lands already timbered, for the production of cross-ties. In like manner concerns which use or supply water are likely in increasing numbers to own permanently forested catchment basins, which will yield them a supplementary income in wood while regulating stream flow or keeping the water pure. It may well be that private forestry is to have its first development in this field rather than among those who supply timber to the general market.

The Need of Legislation

Legislation may be expected to promote forestry on private lands both by encouragement and by regulation. The fire risk and excessive taxation are the greatest hindrances to forestry. Some excellent state fire laws are in force. The principal present want is efficient fire patrol; the burden of this should be divided between private owners and the state. The greater part of forest taxation can and should be made to fall upon the owner when he is in the best position to carry it—that is, when his forest crop is marketable. This is the practice in countries in which forestry is extensively practiced on private lands. Our state laws should be amended to secure the same result. Every effort should be made to get away from the present practice, which in too many cases exacts a penalty for the production of timber.

The regulation of private forest management by the state must move cautiously, yet the impairment or destruction of the efficiency of forests needed to protect the land or water resources should if necessary, and probably will, be made the subject of restrictive legislation. In a recent decision the Supreme Court of the United States held, in effect, that a state has the right to prevent the impairment of its resources. The application of this principle cannot fail to be extended as the evils which result from damage to protective forests are better realized. Such regulation will not, however, deprive the forest owner of his property, though it will restrict him in the use which he may make of it, just as building laws restrict the owner of city property. If the public interest requires that forests should be maintained without the possibility of beneficial use by the private owner, the state itself should take the property over, of course with due compensation.

In the present status of private forestry and of the law it is difficult to predict how far the courts will go in protecting the interest of the community against the results of wasting and mistreating the forest, but the tendency in that direction is growing in strength with remarkable rapidity. The solution reached in certain European countries may be found applicable to our own conditions. Private owners in these countries may handle their forests as they please provided that they do not mismanage them so as to injure other property. To this end private working plans, or plans of felling, are viséed by the local state forest authorities.

One thing at least seems certain—that the public welfare is so vitally concerned in the conservation of forest resources as to make it unthinkable that the private owner alone can be permitted always to decide whether or not forest conservation shall take effect. In this case it is impossible that a man should be allowed to do altogether as he will with his own. The property rights involved must, of course, be recognized and equitably dealt with. But whether through legislative regulation and restriction, purchase through voluntary sale or condemnation, increasing the attractiveness of forestry, or in the natural course of economic development, the country must be assured of permanent supplies of timber.

Nova Scotia already requires timber land owners to contribute on an acreage basis toward the maintenance of a fire-protective system. Since bad conditions on one man's property are a source of danger to all other forest holdings in the neighborhood, regulations concerning the disposal of slash and similar matters might very logically follow or accompany legislation to establish state patrol of forested regions, and the latter would naturally be paid for, in large part at least, by those who own the property. It is a well-known and widely-applied legal maxim that a man must use his own property in such a way as not to injure another. Is there any reason why forests should be exempt from its application?

But, whatever measures of compulsion it may be necessary to employ against the misuse and destruction of a fundamental and necessary resource, there rests a responsibility on the public as well as on the lumberman. If the owner of timber land owes it as a duty, which is likely sooner or later to be required of him, not to ignore the demands of the common welfare, the commonwealth owes it as a duty, both to all its citizens and to the timber land owners themselves, to promote the practice of private forestry through the removal of all artificial obstacles. It should be the task of legislators and administrators to remove these obstacles, and of public-spirited citizens to organize an enlightened and vigorous public opinion, without which the required laws can neither be enacted nor enforced. Once assured of the protection and encouragement to which they are entitled as custodians of a resource necessary to the common welfare, private forest owners will practice forestry so far as it pays them to do so. Where private incentive proves insufficient to conserve the forests the state will need to intervene.